

Subjective Inheritance Expectations and Economic Outcomes*

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Abstract

In this paper we investigate whether and to what extent the expectations on receiving an inheritance act as a driver of economic choices; the fact of expecting a wealth endowment in the future should play a relevant role, particularly if the entity of it is large. In our analysis, we use the DNB Household Survey (DHS) from the Netherlands integrated with a specific module that we designed of subjective probabilities on receiving an inheritance and the amount (in intervals) in the next ten years. Based on these expectations, we look at whether the expected inheritance acts as a deterrent to saving; results suggest, in line with our expectations, that individuals perceive expected inheritances as a potential increase of personal wealth leading toward a reduction in savings.

JEL codes: D14, D84, D91

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Introduction

A large strand of literature has focused on the effect of unexpected income receipt and windfall gains on consumption and saving decisions. The economic rationale, following the life cycle/permanent income hypothesis (Deaton et al. (2002)), suggests that households should just react to unexpected shocks in income and wealth, while expected ones should be already incorporated into the optimal consumption and saving patterns.

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Thus, the timing of expected income receipt should not matter for consumption decisions. Based on these theoretical implications, the empirical literature has considered both expected and unexpected income/wealth changes to test whether the theoretical implications hold and under what circumstances (see Borella et al. (2009), Garcia et al. (1997)). Wealth changes and their impact on consumption choices have been looked at in many aspects, with reference to real estate wealth change (Calcagno et al. (2009)) including inheritance receipt and their impact on labour supply (see Brown et al. (2010)). However, as inheritance does not come as a shock for many of the receivers, little is known about expectations on inheritance and their impact on economic choices.

Inheritance can be conceived as an “unearned income” which should affect earnings, consumption, savings, and other economic outcomes (Imbens et al. (2001)): Brown et al. (2010) use inheritance receipt as a wealth shock and find that it is associated with a significant increase in the probability of retirement, especially when the inheritance is unexpected. Along this line, inheritance, like any other asset, will likely have an effect on household decisions such as the amount of time devoted to leisure/work and consumption.

The role of wealth in modelling labour decisions has been broadly considered (see Krueger & Pischke (1991), Brown et al. (2010), Bloemen & Stanca (2001) on early retirement, Bloemen & Stanca (2001) on labour market participation and Imbens et al. (2001), Henley (2004) on hours worked); however, subjective expectations on bequests can also act as a possible engine driving labour market and savings intentions; along this line, inheritance might, for example, affect labour supply (Joulfaian & Wilhelm (1994)): indeed, Bloemen & Stanca (2001) found wealth to have a significantly positive impact on the reservation wage and a negative impact on the employment probability (higher levels of wealth result in higher reservation wages and higher reservation wages are associated with a lower employment probability). Recent evidence focuses on the effect of receiving an inheritance on the Labour Force Participation (LFP) in married couples: bequests might, indeed, act as trigger in increasing the bargaining power of the recipient affecting his/her LFP providing new evidence on the ability of spouses to commit to a fully efficient allocation of resources within the household (Blau & Goodstein (2016)). Bequests represent a component of wealth: Joulfaian (2006) finds that wealth increases by only a fraction of the inheritances received, and implies a marginal propensity to consume significantly higher than that predicted within the perfect foresight or consumption smoothing frameworks.

In the literature, there have also been many findings on the intention to bequeath: recent ones discuss different alternative assumptions concerning household preferences and show that these assumptions have various implications for bequest motives and bequest division from an inter-country difference point of view (Horioka (2014)); concerning the relationship between actual inheritances and economic decisions, there is some evidence on the effect of actual inheritance on economic behaviour (Brown et al. (2010)). Indeed, along this line, another link to be taken into account is between inheritances and bequests; recent findings suggest that the experience of inheriting can enhance the intention to bequeath (Stark & Nicinska (2015)). While the literature on the intention to bequeath is rich, little has been written on the inheritance expectations and current economic behaviour. Horioka et al. (2003) explore the channel linking bequest expectations and saving behaviour by finding a negative effect. The higher is the expectation of leaving bequests the lower the decumulation pace. On the reverse question, there is some evidence on the effect of actual inheritance on economic behaviour Brown et al. (2010), rather than expected one.

The role of expectations in the economic literature has been widely considered as important driver in shaping economic and financial decisions; expectations on future inheritance could repre-

sent an important factor affecting labour outcomes as well as saving choices. To the best of our knowledge, little evidence still has been found on the possible link between inheritance expectations and individuals' economic behaviours. This constitutes one of the main reasons why this paper aims at studying whether subjective expectations of receiving an inheritance in the future can, in some way, affect financial decisions of individuals. The degree of uncertainty surrounding the size and timing of the receipt of inheritances may influence the pattern of life cycle saving (Weil (1996)) so, expecting a wealth endowment in the future (compared to already having received it) should play a relevant role in shaping the behaviour of people, particularly if the entity of bequests is huge since large inheritances might lead to a decline both in labour force participation and savings (Joulfaian (2006)).

We contribute to the literature by proposing a new source of analysing the relationship between bequests and savings investigating whether there exists a link, and what is the extent of it, between the expectations on bequests and economic decisions (such as savings). In order to do so, our empirical methodology will involve the use of the DNB Household Survey (DHS), a Dutch panel dataset collected by the CentERdata that allows to study both psychological and economic aspects of financial behaviour: this panel survey was launched in 1993 and comprises information on work, pensions, housing, mortgages, income, possessions, loans, health, economic and psychological concepts, and personal characteristics. The dataset is particularly suited for our analysis since it includes many questions about sources of income the respondents may have, it contains very detailed information on assets, liabilities and mortgages; since we are interested in questions concerning the probability of receiving inheritance in the future period, we devised a special module which comprehends few questions that integrate and enrich the dataset providing new information on inheritance expectations.

The direct measurement of expectations has developed throughout the early 1990s since expectations are a key interest in intertemporal economic models and measuring expectations is useful to avoid making strong assumptions (Manski (2002), Manski (2004)); along this line, the measurement of expectations in terms of probabilities has become very important in economics. Elicitation of probabilistic expectations has several desirable features, such as ease of interpretation, ability to characterize uncertainty, possibility of exploiting the algebra of probability to check the internal consistency of a respondent's elicited expectations about different events and interpersonal comparability allowing to reach conclusions about the correspondance between subjective beliefs and "frequentist realities" (Dominitz (1998), Dominitz & Manski (1997), Manski (2004)). De Bresser & van Soest (2015) analyse the determinants of satisfaction with various dimensions of pension arrangements, emphasizing the role of subjective expectations regarding retirement income; the main focus was the validity of subjective expectations elicited through probabilistic measures and the causal impact of expectations on well-being. Indeed, analysing the predictive power of expectations can provide insights into the validity of expectations data; even if it is not possible to verify whether reported probabilities reflect the actual beliefs held by respondents, it might be possible to assess the internal consistency and plausibility of responses: evidence suggests that responses have such "face validity" when the questions concern well-defined events that are relevant to respondents' lives (Manski (2004)). In doing so, De Bresser & van Soest (2015) apply two different methods to construct subjective replacement rate distributions from the reported probabilities. The first, proposed in Dominitz & Manski (1997), fits an assumed underlying (log-normal) distribution for each observation by minimizing the squared difference between the probabilities implied by the assumed distribution and those reported in the data; the second approach, adapted from Bellemare

et al. (2012), uses spline interpolation to fit a subjective distribution that passes through the points corresponding to the probabilities reported by the respondents. The latter is a non-parametric procedure, in the sense that it does not assume any parametric form of the underlying distribution.

Results show that individuals perceive the expected inheritances as a potential increase of personal wealth which leads to a reduction in savings; moreover, expectations seem to matter also in the enhancement of the intention to bequeath and in work vs. leisure choices: indeed, expecting to receive an inheritance increases the chances of leaving a bequest and reduce chances of working at an age of 62 years old (or higher). Eventually, results are robust and in line with our expectations even when dropping individuals who already benefited of a wealth endowment, i.e. individuals whose propensity of saving might have already been shaped through previous money transfers.

Information on inheritances and gifts taxation in the Netherlands In the Netherlands gifts and inheritances are subject to different principles depending also for example on the “inter-generational relationship” between the provider of the gift/inheritance and the recipient. Since we are dealing with inheritance expectations, dimension which might depend on different individual characteristics, such as also for example having already experienced a wealth endowment, before proceeding with the description of data, it might be valuable to illustrate how the taxation and exemption concerning inheritance and gifts work in the Netherlands. One of the most glaring aspects which comes to mind when talking about a donation or an inheritance is related to paying taxes; however, according to the *Belastingdienst*, the Dutch Tax and Customs Administration, there are some exemptions depending on the amount of the gift/inheritance and also depending on the relationship with the donor: for example, in 2016, the maximum amount of a donation from a parent to her son, daughter or foster child exempts up to about 53,000 euros once in the life of a child; along this line, it is also possible to make a donation to a child of about 5,300 euros exempt from tax in a year. In Appendix B, we report all details concerning exemptions and tax rates on donations/inheritances.

The rest of the paper is arranged as follows: Section 1 and Section 2 describe the data and the empirical methodology, in Section 3 we perform and show some robustness checks and extension of our analysis, Section 4 concludes the paper.

1 Data

The empirical analysis involves the use of the DNB Household Survey (DHS), a Dutch panel study collected by the CentERdata, a survey agency at Tilburg University¹ specialized in internet surveys, that allows to study both psychological and economic aspects of financial behaviour; this panel survey was launched in 1993 and comprises information on work and pensions, accommodation and mortgages, income and health, assets and liabilities, economic and psychological concepts. The questionnaires are sent to the respondents via Internet, the respondents fill in the questionnaires at their home computers, and then answers are sent back in the same way: this implies that the questionnaires are self-administered and individuals can answer at the most comfortable time for them. It is important to notice that the selection of panel members of the survey is not dependent on the access to internet: indeed, households without a computer or an internet connection are provided with the necessary equipment.

¹See <https://www.centerdata.nl/en>

1.1 Inheritance expectations

The dataset is particularly suited for our analysis since it includes many questions about sources of income the respondents may have and it contains very detailed information on assets, liabilities and mortgages; however, since we were interested in questions concerning the probability of receiving inheritance in the future period, we devised a special module which comprehends few questions that integrate and enrich the dataset providing new information on inheritance expectations: the questionnaire was fielded from 25 November to 29 November 2016. The overall response rate was 83.8% (2,196 out of 2,621 respondents). We merge our module on inheritance expectations with the 2016 assets and liabilities questionnaire and the economic and psychological concepts. It is important to say that we allow for continuous responses (i.e. the choice of the chance of receiving an inheritance) instead of a binary (yes/no) variable; we think that in this way responses might be more accurate since individuals are in some way forced to reflect more deeply on the question. Furthermore, as reported in Manski (2004) if people can express their expectations in probabilistic form, elicitation of subjective probability distributions should have compelling advantages relative to verbal questioning; probability provides a well-defined absolute numerical scale for responses; hence, there is reason to think that responses may be also interpersonally comparable.

Figures *Fig.1a - Fig.1d* represent the subjective inheritance expectations.

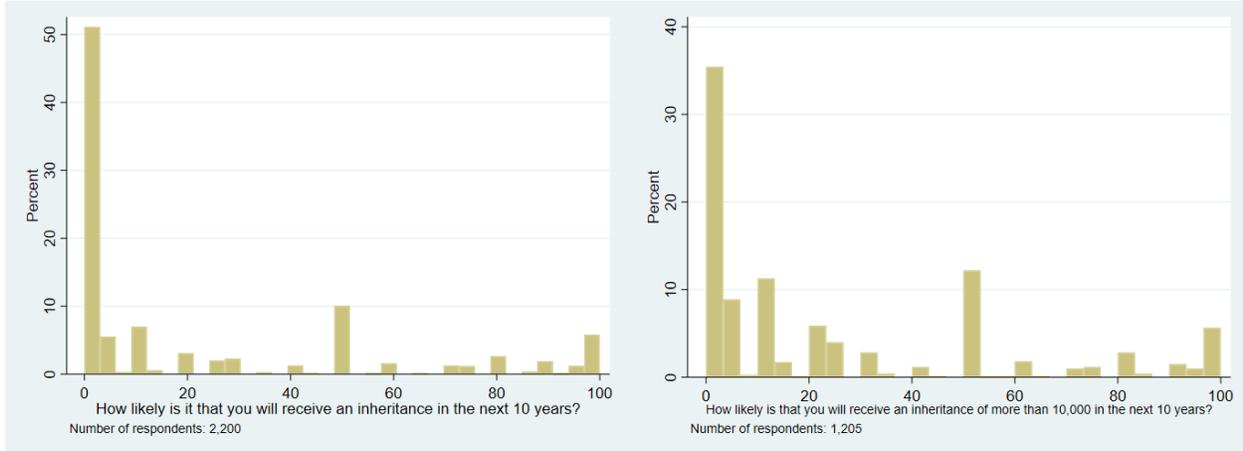
Questions from the module on inheritance expectations

- Q1. How likely is it that you will receive an inheritance in the **next 10 years**? [*if Q1 > 0 then go to Q2*]
- Q2. And how likely is that you will receive an inheritance of **more than 10,000 euros** in the **next 10 years**? [*if Q2 > 0 then go to Q3.*]
- Q3. And how likely is that you will receive an inheritance of **more than 25,000 euros** in the **next 10 years**? [*if Q3 > 0 then go to Q4.*]
- Q4. And how likely is that you will receive an inheritance of **more than 50,000 euros** in the **next 10 years**?

Fill a percentage here from 0 to 100 percent. For example, if you are certain that you will receive an inheritance in the next 10 years, then enter 100%. But if there is still a small chance that you will not receive it, then you enter 97% or less. If you are fully convinced that you will receive no inheritance in the next 10 years, enter 0%. But if there is still a small chance that you will receive it, then you enter for example 3 percent or something more. And if you think the odds are about half, then you fill in 50%, or slightly more or less if that fits better with what you think.

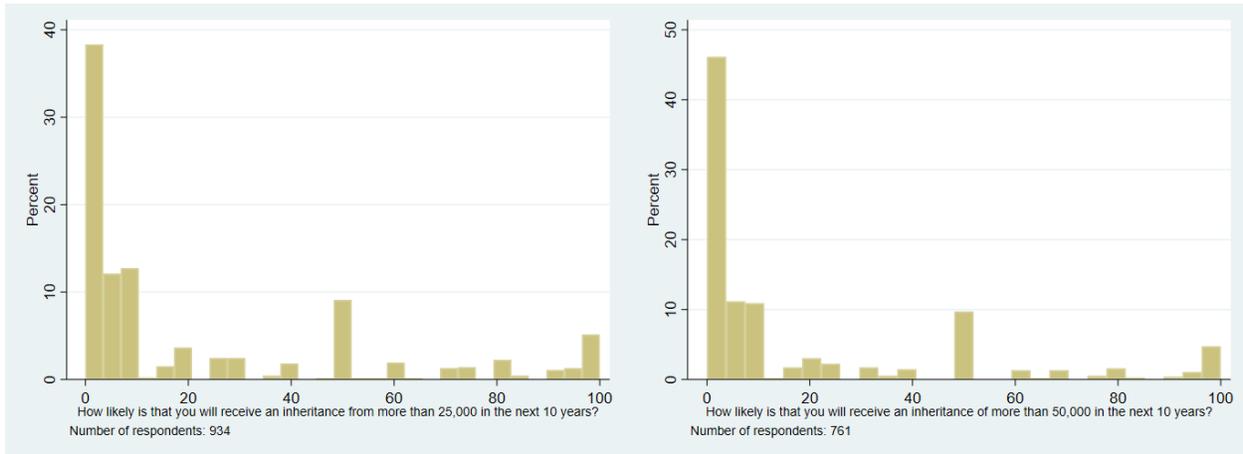
The following figures (*Fig.1a - Fig.1d*) represent the distributions of the subjective inheritance expectations.

Figure 1: Subjective inheritance expectations in 10 years



(a) Expected Inheritance

(b) Expected Inheritance greater than 10,000€



(c) Expected Inheritance greater than 25,000€

(d) Expected Inheritance greater than 50,000€

1.1.1 Are the Expectations Responses Coherent?

Willingness to answer the questions does not necessarily imply that the responses are meaningful; indeed, one possible problem with this probabilistic approach in submitting these questions might be related to “anchoring” problems wherein respondents’ beliefs are influenced by the questions that interviewers happen to pose (Morgan et al. (1992)). Suppose, for example, that a respondent expects her/his chances of receiving an inheritance greater than 50,000 euros; then, by firstly asking the probability of receiving an inheritance greater than 10,000 euros, the respondent may be influenced to think that this amount is objectively reasonable and so may report a higher probability than believed a priori (Dominitz & Manski (1997)). At this point, it could be useful to attempt in understanding if respondents report their expectations coherently.

Response Rates The special module on inheritance expectations has been submitted to 2,621 household members from the CentER panel: among those, 421 individuals do not answer to the questionnaire, 2,196 complete it while 4 members do not complete the survey. The overall response rate has been 83,8%. Analysing the obtained answers, it is interesting to report that there have been 992 who report not to have at all chances of receiving an inheritance, 271 have no chance of bequest greater than €10,000, 172 have zero chance of an inheritance greater than €25,000 and 166 have not at all probability of getting an inheritance greater than €50,000. It might be also interesting to notice that 197 members report the same probability values at all four questions about chances of receiving inheritances: among those, 175 individuals report the same probability value different from 0 or 100 chance. Eventually, there are 22 cases in which the probability of receiving an inheritance for all four cases is always 100.

Table 1: Response Rates

	Number of Respondents	Response Rate (%)
Expected inheritance	2,196	83.78
Expected inheritance > 10k	1,205	45.97
Expected inheritance > 25k	934	35.63
Expected inheritance > 50k	761	29.03

The number of respondents report individuals who answer the module we submitted; the response rate is computed on the whole sample to whom the module has been handed in (2,621 individuals).

Consistency of probabilities Even if probabilistic questions might lead to few problems, as previously discussed, they present some desirable features such as allowing to analyse the predictive power of expectations providing in this way insights into the validity of expectations data. Along this line, it can be possible to assess the internal consistency and plausibility of responses. So, next step concerns the validity of subjective expectations elicited through the probabilistic measures and the causal impact of expectations on well-being; focusing on the predictive power of expectations can provide consistency of the probabilistic measures and give insights into the validity of expectations data. To do so, we follow the approach proposed by De Bresser & van Soest (2015) who perform two different methods to build subjective distributions from reported probabilities: the parametric one proposed in Dominitz & Manski (1997) and the non-parametric approach of Bellemare et al. (2012); in Appendix C, we show the implementation details and descriptive statistics for the parametric approach comparing them with the reported probabilities of our survey.

1.1.2 Descriptive evidence on inheritance expectations data

Here, we report how the chances of receiving an inheritance look like among different age categories; it appears that among people between 45 and 54 years old the probabilities of receiving an inheritance in the next years are higher compared to the other categories; this evidence seems reasonable since individuals in that age category, identifying those with older (grand)parents, could represent the ones with more “solid” and relatively well formed inheritance expectations.

Our analysis focuses on the effect of probability of receiving an inheritance on savings; it should be emphasized that consumption cannot be estimated since in the DHS dataset there is no infor-

Table 2: Mean chances of receiving an inheritance by age categories

Age categories	Chances bequest	Chances inh > 10k	Chances inh > 25k	Chances inh > 50k
16-34 years	22.93	13.48	12.35	10.56
35-44 years	31.46	24.00	19.55	16.22
45-54 years	38.57	37.48	32.21	25.34
55 years and older	14.31	26.33	26.74	24.89
Total	21.72	25.48	23.22	19.65

The table reports the means of chances of receiving an inheritance in all four cases. Statistics are weighted by sample weights.

mation concerning consumption; thus, next section focuses on the construction of the main variable reporting savings.

1.2 Savings Measure

In order to construct a reliable measure for savings, we try to combine the traditional approach in the literature (i.e. approximating savings as the difference between financial assets across years) and a different approach proposed by Alessie & Teppa (2010) in which they exploit different questions concerning saving behaviours and expenditures habits present in the DHS dataset. In constructing the delta in financial assets between 2015 and 2016, we have used information about wealth; we took the most liquid assets (checking accounts, savings or deposit accounts, deposit books, savings certificates, savings arrangements) and subtracted the most liquid liabilities (private loans, extended lines of credit). Hence, following the Alessie & Teppa (2010) way of dealing with the proxy for savings, we firstly use the information about whether any money has been put aside in the previous 12 months; in the case in which there is an assertive answer, individuals are asked to report the amount saved in the same period. Therefore, for those who stated to put aside money, if the change in financial wealth corresponds to the class of money put aside then savings are set equal to the change in the financial wealth; in the opposite case, if the change in financial wealth does not correspond to the class of money put aside then savings are set equal to the midpoints² for each class of the variable reporting the amount of money put aside.

Table 3: Did your household put any money aside in the past 12 months?

	Freq.	Percent	Cum.
Yes	1,476	70.35	70.35
No	622	29.65	100.00
Total	2,098	100.00	

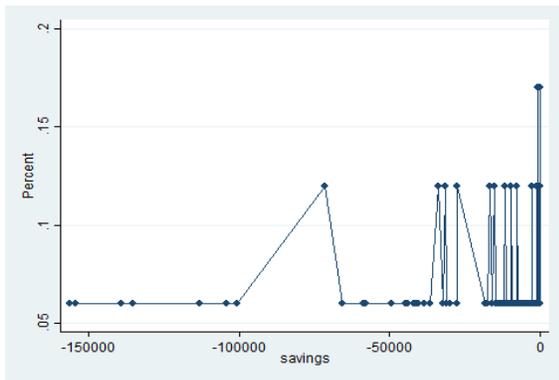
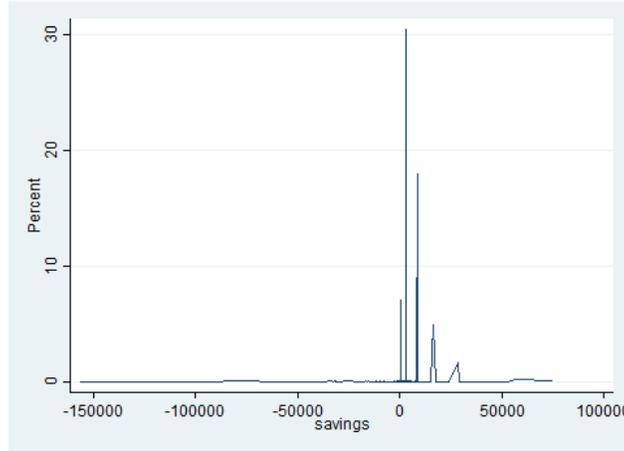
Secondly, for those who declare to not having put any money aside, we cross this information with another question present in the survey, i.e. “*Over the past 12 months, would you say the expenditures of your household were higher than the income of the household, about equal to the income of the household, or lower than the income of the household?*”.

² Following the approach proposed in the paper by Alessie & Teppa (2010), since respondents report the amount of money put aside in classes, we constructed the variable by taking the midpoints for each class.

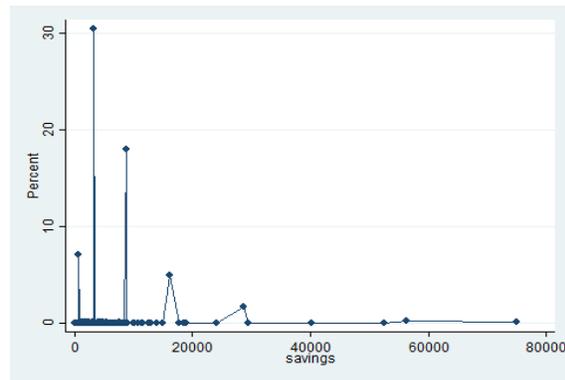
Table 4: Expenditure trends over the past 12 months

	Freq.	Percent	Cum.
Higher than the hh income	332	15.82	15.82
Almost equal to the hh income	969	46.19	62.01
Lower than the hh income	797	37.99	100.00
Total	2,098	100.00	

So, for those who asserted to have put no money aside and whose expenditures were equal to the income of the household, we set zero as the amount of savings (meaning that they did not save as well as not dissaved); for those who claimed to have put no money aside and whose expenditures were higher than the income of the household, we set the (negative) delta of financial wealth signalling that they dissaved; eventually, for those who claimed to have put no money aside but whose expenditures were lower than the income of the household, we set the (positive) delta of financial wealth (meaning that they saved).



(a) Savings below zero



(b) Savings above zero

Figure 2: Savings Distribution

As shown in Figure 2, which reports the original distribution of savings, there is a significant number of zeros which can create some difficulties in understanding how individuals manage their savings; for this reason, we split the distribution differentiating between those below or above zero. It can be noticed that there is a considerable number of negative savings; as such, since wealth regressions might be sensitive to outliers, and also in order to avoid sensible biases in our linear estimation, we trimmed the savings variable and excluded outliers of its distribution ³.

2 Empirical Analysis

The empirical strategy focuses on the effect of probability of receiving an inheritance on savings:

$$Y_i = \alpha + \beta * prob_inh_i^* + \gamma * X_i + \epsilon_i$$

where Y_i , our dependent variable, identifies the savings while X_i collects all demographic and socio-economic control variables such as gender, age, income, level of education, etc partially presented in Section 1. It should be emphasized that in the control variables we also include three controls which capture personal characteristics, which might in some way shape individuals' saving behaviour, such as for example not planning to give large amounts of money to child(ren) or other information concerning attitudes towards lack of receiving allowances or teaching of putting money away as child(ren).

2.1 Probit Estimation

Since our analysis deals with probabilistic questions, we built the dependent variable of our model, i.e. the variable reporting *savings*, as a dummy variable which takes value of 1 if savings are positive and 0 otherwise ^{4 5}. Results from Probit model are presented in Table 5: the sign of the coefficients related to the probability of receiving an inheritance leads toward the direction that we expected; moreover, coefficients related to inheritance expectations are statistically significant. It is worth noticing that there seems to be a gender effect suggesting that women tend to save more compared to men: this might be due to the more conservative and less-risky attitudes of female individuals which can lead toward saving. Along this line, Seguino & Floro (2003) argue that increases in women's wages as well as increases in their share of income lead to higher rates of aggregate saving; this can be due to the different propensities to save probably related to variations

³ Looking at the distribution, both for negative and positive values, we exclude the points too far from the general trend so around -50,000 for the negative variables and around 30,000 euros for the positive savings

* This variable identifies four different cases:

- Chances of receiving an inheritance in next ten years
- Chances of receiving an inheritance greater than €10,000 in next ten years
- Chances of receiving an inheritance greater than €25,000 in next ten years
- Chances of receiving an inheritance greater than €50,000 in next ten years

⁴ Before opting for a non-linear model, we perform an OLS regression: however, results suggest that there is not a linear relationship between savings and chances of receiving an inheritance.

⁵ We also perform a quantile regression with the aim of checking whether the results obtained through OLS might be biased by outliers but results are again not statistically significant and the signs did not always lead toward the expected direction; this might suggest that there is a negative but not linear relationship between savings and expected inheritances.

in external factors that affect saving behaviours. Concerning the variable about the single status, which identifies a one component household without children, it can make sense to think that a *single* might lean to dissave compared to someone that lives with a partner/spouse or someone with children. Another interesting result is related to the variable reporting the intention of giving money support to child(ren): it seems like those who do not intend to give support to their own children tend to spend more (maybe for themselves) and, as a consequence, save less. Moreover, there is a negative effect due to the fact of not having being taught as child toward putting some money away (i.e. saving).

2.2 Ordered Probit Estimation

Eventually, exploiting the possibility of differentiating between those who dissave, neither dissave or save, and those who save, we construct our dependent variable reporting savings in the household as a three categories variable⁶.

Table 6: New specification of dependent variable reporting saving behaviour

Saving, no savings or dissaving	Mean savings	Frequency in percentage values
Dissave	-9937.85	9.78
Neither save or dissave	0	18.96
Save	6137.39	71.26
Total	3401.20	100.00

The table reports the new specification of dependent variable reporting saving behaviour. Statistics are weighted by sample weights.

Results with Ordered Probit confirm once again the negative sign obtained both with the previous specification (see Table 7). Coefficients related to inheritance expectations are statistically significant. In general, all results lead toward the same direction across the different models and specification; it might be worth focusing on the income effect: results seem to be in line with the literature stating that propensity to save and to consume differ substantially across income groups and that high-income households save a greater fraction of income than low-income households (Dynan et al. (2004), Fan (2006) and Huggett & Ventura (2000)).

3 Robustness Check and Extensions of the Analysis

3.1 Money transfer during lifetime could shape individuals' behaviour?

As discussed in the introduction of this work, in the Netherlands gifts and inheritances are subject to different principles depending also for example on the “intergenerational relationship” between the provider of the gift/inheritance and the recipient. Just as reminder, gifts to children are exempt up to an amount of €5,304 (for 2016) per annum; gifts to other parties are exempt up to an amount of €2,122 (for 2016) per annum. As a consequence, it is reasonable to suppose that individuals

⁶ This variable takes *value 1* if savings are below zero (dissaving), *value 2* if savings are exactly equal to zero, *value 3* if savings are greater than zero (saving).

Table 5: Probit Regression

	probit1	probit2	probit3	probit4
Probability Inheritance	-0.1028*** (0.0346)			
Probability Inheritance 10k		-0.1162*** (0.0414)		
Probability Inheritance 25k			-0.0843* (0.0473)	
Probability Inheritance 50k				-0.1065** (0.0540)
Female	0.0483** (0.0240)	0.0496** (0.0240)	0.0511** (0.0240)	0.0514** (0.0240)
Age	-0.0038*** (0.0011)	-0.0036*** (0.0011)	-0.0035*** (0.0010)	-0.0035*** (0.0010)
Income(log)	0.0498*** (0.0131)	0.0486*** (0.0131)	0.0473*** (0.0131)	0.0470*** (0.0130)
Primary Education	-0.8532*** (0.0097)	-0.8525*** (0.0099)	-0.8518*** (0.0097)	-0.8519*** (0.0098)
Secondary Education	-0.8465*** (0.0209)	-0.8422*** (0.0217)	-0.8460*** (0.0214)	-0.8463*** (0.0217)
University Education	-0.9428*** (0.0126)	-0.9398*** (0.0133)	-0.9420*** (0.0131)	-0.9421*** (0.0132)
Retired	0.0117 (0.0302)	0.0125 (0.0301)	0.0180 (0.0298)	0.0184 (0.0298)
Single	-0.0938*** (0.0331)	-0.0941*** (0.0332)	-0.0918*** (0.0331)	-0.0916*** (0.0331)
Child(ren)	0.0089 (0.0390)	0.0097 (0.0392)	0.0113 (0.0394)	0.0110 (0.0394)
No Money Support to Child	-0.0677** (0.0302)	-0.0690** (0.0303)	-0.0691** (0.0304)	-0.0687** (0.0303)
No Allowance as Child	-0.0219 (0.0249)	-0.0259 (0.0251)	-0.0223 (0.0250)	-0.0223 (0.0250)
No SaveTeach as Child	-0.0757** (0.0347)	-0.0728** (0.0345)	-0.0717** (0.0344)	-0.0712** (0.0344)
Observations	1238	1238	1238	1238

Marginal effects reported. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Ordered Probit Regression

	oprobit1	oprobit2	oprobit3	oprobit4
Probability Inheritance	-0.0950*** (0.0329)			
Probability Inheritance 10k		-0.1167*** (0.0401)		
Probability Inheritance 25k			-0.0921** (0.0465)	
Probability Inheritance 50k				-0.1052** (0.0529)
Female	0.0373 (0.0233)	0.0383 (0.0233)	0.0399* (0.0233)	0.0400* (0.0233)
Age	-0.0038*** (0.0011)	-0.0037*** (0.0011)	-0.0036*** (0.0011)	-0.0036*** (0.0011)
Income(log)	0.0399*** (0.0108)	0.0390*** (0.0108)	0.0378*** (0.0108)	0.0373*** (0.0108)
Primary Education	-0.8521*** (0.0099)	-0.8520*** (0.0099)	-0.8513*** (0.0097)	-0.8513*** (0.0098)
Secondary Education	-0.8425*** (0.0211)	-0.8434*** (0.0212)	-0.8470*** (0.0208)	-0.8475*** (0.0209)
University Education	-0.9399*** (0.0128)	-0.9403*** (0.0130)	-0.9422*** (0.0127)	-0.9425*** (0.0127)
Retired	0.0260 (0.0293)	0.0250 (0.0295)	0.0299 (0.0292)	0.0310 (0.0291)
Single	-0.0798** (0.0310)	-0.0805*** (0.0312)	-0.0786** (0.0311)	-0.0779** (0.0309)
Child(ren)	0.0099 (0.0378)	0.0104 (0.0379)	0.0120 (0.0381)	0.0121 (0.0380)
No Money Support to Child	-0.0707** (0.0296)	-0.0721** (0.0297)	-0.0723** (0.0297)	-0.0717** (0.0296)
No Allowance as Child	-0.0302 (0.0243)	-0.0348 (0.0245)	-0.0313 (0.0245)	-0.0309 (0.0244)
No SaveTeach as Child	-0.0647** (0.0317)	-0.0628** (0.0316)	-0.0619* (0.0316)	-0.0611* (0.0315)
Observations	1238	1238	1238	1238

Marginal effects reported. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

might have already received gifts/inheritance during their lives. This fact could cause two effects: first of all, individuals are in some way “prepared” to the concept of receiving a gift or an inheritance at some point of their life; secondly, the propensity of saving might be shaped through these money transfers.

In order to analyse, whether the results might be in some way driven by those who already received an inheritance or a gift, we conduct a robustness check dropping those who already benefited of a wealth endowment. To do so, the model of reference is the same (i.e. our dependent variable is the three-categories variable reporting savings and the main regressors are the same as before). Table 8 shows results from Ordered Probit without individuals who benefited from a wealth endowment in the previous year: signs and statistical significance of the coefficients related to inheritance expectations are confirmed. However, it is worth to be considered that the proportion of individuals who received a gift/inheritance is very little (more or less about the 10% of the total sample). It might be interesting to notice the effect related to the variables capturing personal characteristics such as not planning to give large amounts of money to child(ren) or not being taught to save during childhood: it seems that individuals who did not receive any teaching in saving money or (almost) never receive an allowance as child show higher probabilities of dissaving compared to the excluded categories who experienced that type of practice.

3.2 Extensions of the Analysis

The analysis conducted so far aims at contributing to the understanding of the dynamics of wealth distribution, intergenerational transmission of income and wealth dispersion. What we want to do in this section is considering other economic outcomes, different from savings, which should be affected as well by the formation of positive inheritance expectations in the future: a first link that is worth to be considered is the one between inheritances (specifically expected inheritances) and bequests; thereafter, we will also take into account the effect on the choice of work vs. leisure.

3.2.1 Can expecting an inheritance have an impact on individuals’ willingness to leave bequests?

As reported in the work by Stark & Nicinska (2015), it is reasonable to expect that the receipt of an inheritance will create an environment that is conducive to making bequests, such that bequeathing will correlate positively with inheriting. However, the argument could also run in the opposite direction: people who did not receive an inheritance and who found it difficult to get on in life without the support provided by an inheritance will not want their children to be subjected to a similar experience, assuming, of course, that people are altruistic towards their children.

The experience of inheriting can enhance the intention to bequeath (Stark & Nicinska (2015)); in the same way, also expectation of inheriting can have a positive impact on the intention to bequeath. For this reason, we exploit the question reporting the chances of leaving an inheritance as new dependent variable of our model. In order to see if there is effectively a relationship between expecting an inheritance and being inclined to bequeath, we consider, as done in the previous specifications, as main explanatory variables of interest our four probabilities of receiving an inheritance. Results suggest that expecting to receive an inheritance might increase the chances of leaving a bequest; other interesting results come to light from this analysis: income plays a role, indeed it is reasonable to imagine that rich households might be the one who are going to perform a higher chances of leaving a bequest to their relatives; another noticeable result comes

Table 8: Ordered Probit without those who already received an inheritance

	NoInh1	NoInh2	NoInh3	NoInh4
Probability Inheritance	-0.1063*** (0.0352)			
Probability Inheritance 10k		-0.1278*** (0.0435)		
Probability Inheritance 25k			-0.1089** (0.0511)	
Probability Inheritance 50k				-0.1194** (0.0594)
Female	0.0349 (0.0244)	0.0361 (0.0245)	0.0377 (0.0245)	0.0375 (0.0245)
Age	-0.0039*** (0.0011)	-0.0037*** (0.0011)	-0.0037*** (0.0011)	-0.0037*** (0.0011)
Income(log)	0.0374*** (0.0113)	0.0361*** (0.0113)	0.0353*** (0.0113)	0.0345*** (0.0113)
Primary Education	-0.8455*** (0.0103)	-0.8453*** (0.0099)	-0.8428*** (0.0102)	-0.8428*** (0.0103)
Secondary Education	-0.8492*** (0.0201)	-0.8510*** (0.0200)	-0.8354*** (0.0220)	-0.8360*** (0.0221)
University Education	-0.9480*** (0.0113)	-0.9488*** (0.0113)	-0.9385*** (0.0135)	-0.9389*** (0.0135)
Retired	0.0295 (0.0309)	0.0295 (0.0310)	0.0341 (0.0307)	0.0359 (0.0306)
Single	-0.0828** (0.0323)	-0.0836** (0.0325)	-0.0819** (0.0325)	-0.0805** (0.0323)
Child(ren)	0.0068 (0.0396)	0.0089 (0.0398)	0.0101 (0.0400)	0.0098 (0.0399)
No Money Support to Child	-0.0647** (0.0311)	-0.0666** (0.0311)	-0.0671** (0.0313)	-0.0659** (0.0311)
No Allowance as Child	-0.0303 (0.0254)	-0.0355 (0.0257)	-0.0320 (0.0256)	-0.0316 (0.0256)
No SaveTeach as Child	-0.0665** (0.0326)	-0.0642** (0.0325)	-0.0640** (0.0326)	-0.0632* (0.0325)
Observations	1172	1172	1172	1172

Marginal effects reported. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

from being a single household, indeed being alone in the household might imply lower probabilities of bequeathing to someone.

Table 9: Impact of inheritance expectations on intention to bequeath

	Bequeath1	Bequeath2	Bequeath3	Bequeath4
Probability Inheritance	0.128*** (0.030)			
Probability Inheritance 10k		0.135*** (0.035)		
Probability Inheritance 25k			0.156*** (0.039)	
Probability Inheritance 50k				0.150*** (0.045)
Female	0.00364 (0.020)	0.00209 (0.020)	-0.000670 (0.020)	-0.000401 (0.020)
Age	-0.00363*** (0.001)	-0.00383*** (0.001)	-0.00392*** (0.001)	-0.00389*** (0.001)
Income(log)	0.0427*** (0.013)	0.0444*** (0.013)	0.0446*** (0.013)	0.0458*** (0.013)
Primary Education	0.261* (0.140)	0.254* (0.144)	0.252* (0.144)	0.255* (0.144)
Secondary Education	0.107 (0.126)	0.0991 (0.131)	0.101 (0.130)	0.104 (0.130)
University Education	0.200 (0.126)	0.191 (0.131)	0.192 (0.130)	0.195 (0.130)
Retired	0.178*** (0.028)	0.175*** (0.028)	0.174*** (0.028)	0.170*** (0.028)
Single	-0.0678*** (0.025)	-0.0672*** (0.025)	-0.0662*** (0.025)	-0.0686*** (0.025)
Child(ren)	0.172*** (0.028)	0.172*** (0.028)	0.173*** (0.028)	0.172*** (0.028)
No Money Support to Child	-0.193*** (0.022)	-0.193*** (0.022)	-0.191*** (0.022)	-0.193*** (0.022)
No Allowance as Child	-0.00539 (0.022)	-0.00201 (0.022)	-0.00292 (0.022)	-0.00438 (0.022)
No SaveTeach as Child	-0.101*** (0.027)	-0.105*** (0.027)	-0.105*** (0.027)	-0.106*** (0.027)
Observations	1238	1238	1238	1238

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3.2.2 Can expecting an inheritance have an impact on working at 62 years old?

The effect of wealth on labour market behaviour has been broadly considered in the literature (Doorley & Pestel (2016)); wealth endowment might model labour decisions (see Krueger & Pischke (1991), Brown et al. (2010), Bloemen & Stanca (2001) on early retirement, Bloemen &

Stancanelli (2001) on labour market participation and Imbens et al. (2001), Henley (2004) on hours worked). Inheritance, like any other asset, might, for example, affect labour supply (Joulfaian & Wilhelm (1994)): indeed, Bloemen & Stancanelli (2001) found wealth to have a significantly positive impact on the reservation wage and a negative impact on the employment probability. Therefore, individual's labour market behaviour may be expected to react to a wealth shock: along this line, inheritance will likely have an effect on household decisions such as the amount of time devoted to leisure/work and consumption.

Thence, it seems reasonable to think that expecting an inheritance might also shape choices related to labour decisions as well as saving choices. So, exploiting the question reporting the chances of working at an age greater or equal to 62 years old and using it as dependent variable of this model, we run a last regression considering as main explanatory variables inheritance expectations: coefficients are negative and statistically significant, suggesting that the chances of working at an age of 62 years old or higher for people who expect an inheritance receiving are lower compared to those who do not have positive inheritance expectations; an interesting result worthy of a specific attention is for example the one gender specific: women seem to show lower chances of working and this can be related to the low female labour market participation.

4 Final Remarks

In this paper we investigate whether and to what extent expecting an inheritance acts as driver in economic choices; in particular, we focus on the effect on savings and on the intention to bequeath. We contribute to the literature by proposing a new source of analysing the relationship between bequests and savings. In doing so, we use a Dutch dataset integrated with a specific module that we designed on reporting subjective probabilities on receiving an inheritance and the relative amount (in intervals) in the next ten years.

Results show that individuals perceive the expected inheritances as a potential increase of personal wealth which leads to a reduction in savings; moreover, expectations seem to matter also in the enhancement of the intention to bequeath: indeed, expecting to receive an inheritance increases the chances of leaving a bequest. Eventually, considering the fact that money transfers during an individual's lifetime might shape her behaviour, we drop those who already benefited of a wealth endowment: even without those observations, results are robust and in line with our expectations.

We are aware that this work has several limitations that should be kept in mind when considering the results: firstly, the research population consisted of a selected sample, this might pose limits on the generalizability of the results; secondly, there might be problems of endogeneity which might be related to unobservable features of parents (e.g., propensity to save, health status, age, economic situation, etc.) that might shape inheritance expectations; however, due to data limitation, we have no information concerning these personal characteristics. Future research is needed to deeply study this link and maybe extend it taking into account other financial aspects such as debts, equity, investments, etc.

Table 10: Impact of inheritance expectations on probability of working

	probwork1	probwork2	probwork3	probwork4
Probability Inheritance	-0.0921*			
	(0.051)			
Probability Inheritance 10k		-0.102*		
		(0.058)		
Probability Inheritance 25k			-0.188***	
			(0.061)	
Probability Inheritance 50k				-0.219***
				(0.069)
Female	-0.280***	-0.279***	-0.276***	-0.275***
	(0.034)	(0.034)	(0.034)	(0.034)
Age	-0.00576***	-0.00575***	-0.00547***	-0.00566***
	(0.002)	(0.002)	(0.002)	(0.002)
Income(log)	0.0649***	0.0649***	0.0671***	0.0665***
	(0.024)	(0.024)	(0.024)	(0.024)
Primary Education	-0.128	-0.137	-0.140	-0.136
	(0.157)	(0.153)	(0.154)	(0.154)
Secondary Education	0.256**	0.269**	0.275**	0.273**
	(0.102)	(0.106)	(0.108)	(0.108)
University Education	0.281***	0.293***	0.300***	0.297***
	(0.101)	(0.106)	(0.107)	(0.107)
Retired	-0.475***	-0.466***	-0.468***	-0.457***
	(0.091)	(0.089)	(0.087)	(0.087)
Single	-0.00957	-0.00915	-0.0149	-0.0129
	(0.045)	(0.045)	(0.045)	(0.045)
Child(ren)	0.00642	0.00359	-0.0000700	-0.00183
	(0.051)	(0.051)	(0.051)	(0.051)
No Money Support to Child	0.0202	0.0213	0.0210	0.0266
	(0.045)	(0.045)	(0.044)	(0.044)
No Allowance as Child	-0.0679	-0.0720*	-0.0765*	-0.0774*
	(0.043)	(0.043)	(0.043)	(0.042)
No SaveTeach as Child	0.0257	0.0299	0.0222	0.0273
	(0.057)	(0.057)	(0.057)	(0.056)
Observations	529	529	529	529

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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A Appendix A

A.1 Descriptive Statistics from Regressions Sample

Table A.1: Descriptive Statistics

	Mean	Standard Deviation	Median	Min	Max	N
Age	56.47	16.09	60.00	16	91	1238
Child(ren)	0.72	0.45	1.00	0	1	1238
Female	0.44	0.50	0.00	0	1	1238
Income	26226.13	20642.80	23923.89	40	402384	1238
Income(log)	9.91	0.89	10.08	4	13	1238
Leave Inheritance	0.58	0.35	0.70	0	1	1238
No Money Support to Child	0.53	0.50	1.00	0	1	1238
No Allowance as Child	0.32	0.47	0.00	0	1	1238
No SaveTeach as Child	0.15	0.36	0.00	0	1	1238
Primary Education	0.03	0.16	0.00	0	1	1238
Probability Inheritance	0.22	0.32	0.03	0	1	1238
Probability Inheritance 10k	0.14	0.26	0.00	0	1	1238
Probability Inheritance 25k	0.10	0.23	0.00	0	1	1238
Probability Inheritance 50k	0.07	0.19	0.00	0	1	1238
Probability Working 62 years old	0.56	0.40	0.70	0	1	529
Retired	0.34	0.47	0.00	0	1	1238
Savings	4145.28	7737.04	3250.00	-65550	29500	1034
Secondary Education	0.55	0.50	1.00	0	1	1238
Single	0.22	0.42	0.00	0	1	1238
University Education	0.42	0.49	0.00	0	1	1238

Table A.2: Description of the Variables

	Description
Age	Age of the individual
Child(ren)	Do you have any children?
Female	Gender of the individual is a woman
Income	Income earned in 2016
Income(log)	Income earned in 2016, expressed in logarithmic form
Leave Inheritance	What is the chance that you will leave an inheritance
No Allowance as Child	When you were between 8 and 12 years of age, did you receive an allowance from your parents then?
No Money Support to Child	Do you give large amounts of money to your children in order to transfer part of your capital to them, or are you planning to do so in the future?
No SaveTeach as Child	Did your (grand)parents stimulate you to save money between the age of 12 and 16?
Primary Education	Primary school level education
Probability Inheritance	How likely is it that you will receive an inheritance in the next 10 years?
Probability Inheritance 10k	And how likely is that you will receive an inheritance of more than €10,000 in the next 10 years?
Probability Inheritance 25k	And how likely is that you will receive an inheritance of more than €25,000 in the next 10 years?
Probability Inheritance 50k	And how likely is that you will receive an inheritance of more than €50,000 in the next 10 years?
Probability Working 62 yrs	What are the chances, you think, of you having a full time paid job at the age of 62 or older?
Retired	Dummy variable indicating whether or not the individual is retired
Savings	Amount of savings
Secondary Education	Secondary school level education
Single	One component household without children
University Education	University level education

B Appendix B

Exemptions and rates of gift and inheritance tax are corrected each year with an inflation correction. An exemption means that the recipient pays donation tax only if the value of it is higher than a certain amount. The following tables report the gift/inheritance exemptions.

Table B.1: Donation Tax Exemptions 2016

Relationship with the donor	Exemption gift tax	Use of the donation
(foster) child	5,304 annually	general purpose
(foster) child 18-39 years*	25,449 one-off	general purpose
	53,016 one-off	house (renovation or repayment mortgage)
remaining	2,122 annually	general purpose

Reference year: 2016. All amounts are expressed in euros. Source: *Belastingdienst* (The Netherlands)
 * For the increased exemptions, people can only use it once in their life. If recipient is 40 years old or older, but her partner is younger than 40: then, exemption applies.

Table B.2: Inheritance Tax Exemptions 2016

Relation to deceased	Exemption
partner (spouse / registered partner / notarial cohabitant)	636,180
children	20,148
grandchildren	20,148
certain sick and disabled children	60,439
parents	47,715
all others	2,122

Reference year: 2016. All amounts are expressed in euros. Source: *Belastingdienst* (The Netherlands).

In the case in which the value of the donation is lower than or equal to the exemption then, the recipient does not pay a gift/inheritance tax; on the other side, if the value of donation is higher than the exemption, then, the recipient has to pay the tax on the amount that exceeds the exemption. The amount of gift/inheritance tax to be paid depends on the relationship with the donor/deceased and the value of the donation.

Table B.3: Rates for gift and inheritance tax 2016

Tariff group	Value of acquisition	Rates percentage
partner and (foster) children	0 - 121,902	10%
	more than 121,903	20%
grandchildren and further descendants	0 - 121,902	18%
	more than 121,903	36%
remaining	0 - 121,902	30%
	more than 121,903	40%

Reference year: 2016. All amounts are expressed in euros. Source: *Belastingdienst* (The Netherlands).

C Appendix C

C.1 Subjective distributions of inheritance expectations

As explained in Section 1 discussing the consistency of probabilities, we present the approach to derive subjective probability distributions from the observed inheritance expectations data. These probabilities are interpreted as points on the subjective cumulative probability distribution function of the inheritance expectations of individuals from our sample.

C.1.1 Parametric approach

The parametric approach, proposed by Dominitz & Manski (1997), assumes that the reported probabilities follow from some parametric underlying distribution. Given the distribution and the reported inheritance expectations IE_k , the parameters θ_i of the distribution can be estimated by fitting the probabilities implied by the distribution, $F(IE_k; \theta_i)$, to those reported in the data. Assuming that subjective distributions are lognormal, we can write $F(IE_k; \theta_i)$ as:

$$F(IE_k; \theta_i) = 1 - \Phi\left(\frac{\ln[IE_k] - \mu_i}{\sigma_i}\right)$$

where $\Phi(\cdot)$ is the standard normal cdf and μ_i and σ_i are individual specific parameters to be estimated.

The objective function defining the best possible fit chosen by Dominitz & Manski (1997) is the sum of the squared differences between implied and reported probabilities. Along this line, for each i , we choose the pair (μ_i, σ_i) that solves the least squares problem:

$$\min_{\mu_i, \sigma_i} \sum_{k=1}^4 [F_{ik} - F(IE_k; \mu_i, \sigma_i)]^2$$

Once the parameters of the lognormal distribution are estimated, we can compute the descriptive statistics of the subjective inheritance expectations. In Table C.1, it follows the comparison between the observed (original) inheritance expectations and the ones reconstructed through the parametric approach previously presented.

Table C.1: Descriptive Statistics

	Mean	Standard Deviation	Median	Min	Max	N
Probability Inheritance	0.22	0.32	0.03	0	1	1238
Probability Inheritance 10k	0.14	0.26	0.00	0	1	1238
Probability Inheritance 25k	0.10	0.23	0.00	0	1	1238
Probability Inheritance 50k	0.07	0.19	0.00	0	1	1238
Subjective Inheritance	0.20	0.31	0.00	0	1	1238
Subjective Inheritance 10k	0.13	0.25	0.00	0	1	1238
Subjective Inheritance 25k	0.09	0.22	0.00	0	1	1238
Subjective Inheritance 50k	0.06	0.19	0.00	0	1	1238